

In the claims:

For the Examiner's convenience, all pending claims are presented below with changes shown in accordance with the mandatory amendment format.

1. (Currently Amended) A computer-implemented method, comprising:
  - providing at least three elements, including a first element and a last element, each element having an associated parameter;
  - providing a first identifier for the first element;
  - for a first sequential execution of the at least three elements, performing a first operation on ~~the first identifier and at least one of the associated parameters of the at least three elements~~ to produce a transform;
  - saving the transform;
  - for a second sequential execution of the elements, performing a second operation on ~~the first identifier and the transform~~ to produce a last identifier associated with the last element;
  - using the last identifier to access a location in a multi-element prediction array ~~comprising of including~~ at least a shift value and a transform; and
  - using a content of said location to predict a decision status of the last element.

2-6. (Canceled)

7. (Currently Amended) The computer-implemented method of claim 1, wherein performing the second operation includes:
  - shifting the first identifier to produce a shifted identifier; and

performing an exclusive OR operation on the shifted identifier and the transform to produce the last identifier.

8. (Canceled)

9. (Currently Amended) The computer-implemented method of claim 1, wherein the at least three elements are branch instructions in an instruction execution pipeline.

10. (Currently Amended) The computer-implemented method of claim 1, further comprising:

using a last index to access a location in a prediction array; and

using a content of said location to predict a decision status of the last element.

11-20. (Canceled)

21. (Previously Presented) A circuit, comprising:

a register to store a base index of a base element;

a data shifting circuit having an input coupled to an output of the register, the data shifting circuit to shift the base index to create a shifted base index;

an exclusive OR circuit having a first input coupled to an output of the data shifting circuit;

multi-element array including comprising of at least a data shift information value and [[a]] transform data, said array coupled to a second input of the exclusive OR circuit to transfer the transform data to the exclusive OR circuit, and further coupled to the data shifting circuit to transfer the data shift information to the data shifting circuit, wherein the

transform data is a result of an operation performed on parameters associated the base element and all elements between the base element and an element to be predicted; and  
a prediction logic circuit coupled to an output of the exclusive OR circuit;  
wherein the exclusive OR circuit performs an exclusive OR operation on the shifted base index and the transform data to output to the prediction logic circuit a prediction index for the element to be predicted.

22. (Canceled)

23. (Original) The circuit of claim 21, wherein the data shifting circuit includes a plurality of inputs coupled to the output of the register to shift data from the register by a selected number of bits.

24. (Currently Amended) A computer system comprising:

an instruction execution pipeline; and  
a transform generation circuit coupled to the instruction execution pipeline and including:  
a register to store a base index of a base element;  
a data shifting circuit having an input coupled to an output of the register, the data shifting circuit to shift the base index to create a shifted base index;  
an exclusive OR circuit having a first input coupled to an output of the data shifting circuit;

multi-element array including comprising of at least a data shift information value and [[a]] transform data, said array coupled to a second input of the exclusive OR circuit to transfer the transform data to the exclusive OR circuit, and further

coupled to the data shifting circuit to transfer the data shift information to the data shifting circuit, wherein the transform data is a result of an operation performed on parameters associated the base element and all elements between the base element and an element to be predicted; and

a prediction logic circuit coupled to an output of the exclusive OR circuit; wherein the exclusive OR circuit performs an exclusive OR operation on the shifted base index and the transform data to output to the prediction logic circuit a prediction index for the element to be predicted.

25. (Canceled)

26. (Original) The computer system of claim 24, wherein the data shifting circuit includes a plurality of inputs coupled to the output of the register to shift data from the register by a selected number of bits.

27. (Currently Amended) A machine-readable medium having stored thereon instructions, which when executed by at least one processor cause said at least one processor to perform:

providing at least three elements, including a first element and a last element, each element having an associated parameter;

providing a first identifier for the first element;

for a first sequential execution of the at least three elements, performing a first operation on ~~the first identifier and at least one of the associated parameters of the at least three elements~~ to produce a transform;

saving the transform;

for a second sequential execution of the elements, performing a second operation on the first identifier and the transform to produce a last identifier associated with the last element;

using the last identifier to access a location in a multi-element prediction array comprising of including at least a shift value and a transform; and  
using a content of said location to predict a decision status of the last element.

28. (New) The computer-implemented method of claim 1, wherein performing the first operation includes:

shifting each subsequent parameter of the associated parameters one bit in relation to a previous associated parameter to produce shifted associated parameters;  
performing an exclusive OR operation on the shifted associated parameters to produce the transform.

29. (New) The computer-implemented method of claim 9, wherein the first identifier and the last identifier are global history indices for the branch instructions of their associated elements.

30. (New) The circuit of claim 21, wherein the prediction logic circuit to use the prediction index to predict a decision status of the element to be predicted.

31. (New) The circuit of claim 35, wherein one or more indices associated with elements between the base element and the element to be predicted in a program order are ignored by the circuit in predicting the decision status of the element to be predicted.

32. (New) The computer system of claim 24, wherein the prediction logic circuit to use the prediction index to predict a decision status of the element to be predicted.

33. (New) The computer system of claim 37, wherein one or more indices associated with elements between the base element and the element to be predicted in a program order are ignored by the circuit in predicting the decision status of the element to be predicted.

34. (New) The machine-readable medium of claim 27, wherein performing the second operation includes:

shifting the first identifier to produce a shifted identifier; and

performing an exclusive OR operation on the shifted identifier and the transform to produce the last identifier.

35. (New) The machine-readable medium of claim 27, wherein the at least three elements are branch instructions in an instruction execution pipeline.

36. (New) The machine-readable medium of claim 27, further comprising said at least one processor to perform:

using a last index to access a location in a prediction array; and

using a content of said location to predict a decision status of the last element.

37. (New) The machine-readable medium of claim 27, wherein performing the first operation includes:

shifting each of the associated parameters to produce shifted associated parameters;

performing an exclusive OR operation on the shifted associated parameters to produce the transform.

38. (New) The machine-readable medium of claim 31, wherein the first identifier and the last identifier are global history indices for the branch instructions of their associated elements.